

CLAIMS:

1. A soil moisture content measurement system comprising:
 - a porous plate arranged to support a soil sample;
 - 5 a hanging water tube extending downwardly from the porous plate, the tube arranged to convey liquid toward and away from the porous plate;
 - a measuring capillary tube in connection with the hanging water tube, the measuring capillary tube arranged to convey liquid toward and away from the hanging water tube, the measuring capillary tube arranged to be raised and/or lowered with
10 respect to the soil sample;
 - measurement apparatus configured to measure the movement of liquid within the measuring capillary tube; and
 - 15 a data memory configured to receive and store data from the measurement apparatus representing liquid movement measurements within the measuring capillary tube.
2. A soil moisture content measurement system as claimed in claim 1 wherein the porous plate is elevated with respect to the measuring capillary tube.
- 20 3. A soil moisture content measurement system as claimed in any one of the preceding claims further comprising:
 - a liquid receptacle elevated with respect to the hanging water tube and/or the measuring capillary tube; and
 - 25 a supply tube extending downwardly from the liquid receptacle, the tube in connection with and arranged to convey liquid to the hanging water tube and/or the measuring capillary tube.
- 30 4. A soil moisture content measurement system as claimed in any one of the preceding claims further comprising a microcontroller associated with the data memory, the microcontroller configured to monitor the movement of liquid in the measuring capillary tube and control movement of liquid between the hanging water tube and the

measuring capillary tube by raising or lowering the measuring capillary tube with respect to the soil sample.

5. A soil moisture content measurement system as claimed in claim 4 wherein the
5 data memory and microcontroller are connectable to a computer device.

6. A soil moisture content measurement system as claimed in claim 5 wherein data stored in the data memory is transferable to the computer device.

10 7. A soil moisture content measurement system as claimed in claim 5 or claim 6 wherein commands are transferred from the computer device to the microcontroller.

15 8. A soil moisture content measurement system as claimed in any one of the preceding claims wherein the measurement apparatus comprises a series of infrared emitter and infrared detector pairs spaced along the measuring capillary tube.

9. A method of measuring a moisture retention curve of a soil sample comprising the steps of:

supporting a soil sample on a porous plate;

20 positioning the height of a measuring capillary tube with respect to the porous plate to enable liquid to be conveyed between the measuring capillary tube and the porous plate;

positioning a hanging water tube to convey liquid between the porous plate and the measuring capillary tube;

25 performing at least one purging cycle in which liquid is introduced into the measuring capillary tube and the soil sample;

30 performing at least one drying cycle in which the measuring capillary tube is substantially emptied of liquid, liquid is permitted to travel from the soil sample through the porous plate to the measuring capillary tube, and the movement of liquid within the measuring capillary tube is measured;

storing in computer memory data representing liquid movement measurements within the measuring capillary tube; and

calculating the moisture retention curve from the data representing liquid movement measurements.

10. A method of measuring a moisture retention curve as claimed in claim 9 further comprising the step of periodically substantially emptying the measuring capillary tube of liquid during the drying cycle once the volume of liquid within the measuring capillary tube reaches a predefined maximum.
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11. A method of measuring a moisture retention curve as claimed in claim 9 or claim 10 further comprising the step of terminating the or each drying cycle on detection of substantially no movement of liquid within the measuring capillary tube during a predefined time limit.
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12. A method of measuring a moisture retention curve as claimed in claim 9 or claim 10 further comprising the step of terminating the or each drying cycle on user input.
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13. A method of measuring a moisture retention curve as claimed in any one of claims 9 to 12 further comprising the step of performing, after the or each drying cycle, one or more wetting cycles in which liquid is permitted to travel from the measuring capillary tube through the porous plate to the soil sample, and the movement of liquid within the measuring capillary tube is measured.
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14. A method of measuring a moisture retention curve as claimed in claim 13 further comprising the step of periodically introducing liquid into the measuring capillary tube once the tube is substantially empty of liquid.
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15. A method of measuring a moisture retention curve as claimed in claim 13 or claim 14 further comprising the step of terminating the or each wetting cycle on detection of substantially no movement of liquid within the measuring capillary tube during a predefined time limit.
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16. A method of measuring a moisture retention curve as claimed in claim 13 or claim 14 further comprising the step of terminating the or each wetting cycle on user input.